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HOT PLATE

Cat. 7280

1 GENERAL

The Hot Plate has been designed to perform rapid precise screening of narcotic type analgesic drugs (morphine, codeine, etc.) on the animal by the *hot plate test*.

This method, devised by N.B. Eddy and D. Leimbach (see paragraph 10-BIBLIOGRAPHY) evaluates the reaction time of mice which are dropped on a heated surface and thus confronted with a heat stimulus applied to the plantar surface.

When a central analgesic is administered to the animals this reaction time is markedly increased.

The **new Hot Plate 7280** is a microprocessor controlled unit, providing:-

a) Evaluation of reaction time in steps of one tenth of second.

b) Data monitoring and experiment setting on the original angled command module/display unit (see picture) whose panel can be oriented for a comfortable reading.

c) Direct connection to the PC and to the optional Mini-Printer Cat. 7145, in order to print the obtained data.

1.1 Instrument Description

The Instrument consists of:

1) two Perspex restrainers (one for mice and one for rats) see paragraph 1.2.

2) a Basic Unit, incorporating Heating Plate and

3) a Command/Display Orientable Module, see paragraph 1.4.

1.2 Animal Restrainers

The animals are confined by a clear removable Perspex hood. Two hoods are provided with the standard package: one for mice and one for rats.

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1.3 Heating Plate

The **heating plate** is cut from a 4 mm thick “electrolytic” copper sheet and is mated to high surface heating elements which provide even temperature to the entire test area.

A solid state **temperature regulator** senses the plate temperature via a digital thermometer and powers the heating elements through a proportional circuit which minimizes overshoot.

The temperature of the plate is set by the operator in the range 30-60°C via “soft keys”, see paragraph 1.4.2.

1.3.1 Back Panel

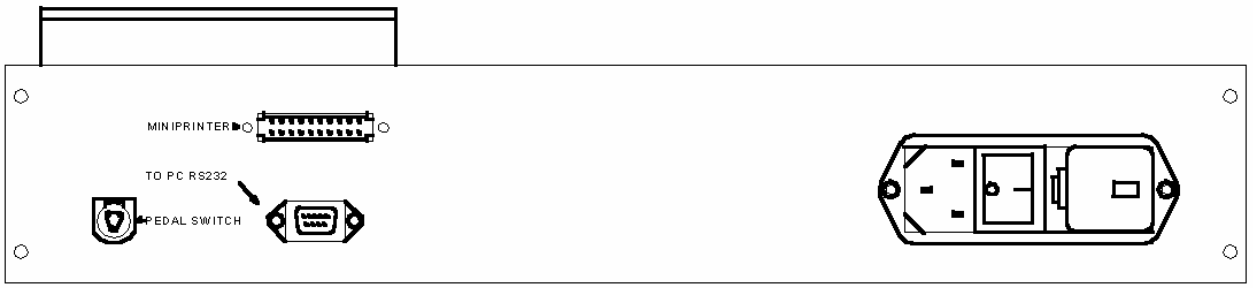


Figure 1 “Back Panel”

The back panel (see Figure 1) embodies, from left to right, a 3-pin circular connector for the pedal switch, a 20-PIN connector for branching to the 7145 Miniprinter, a Delta 9-pin Connector (labelled TO PC RS232C) for branching the Hot Plate to the PC and the POWER MODULE, see also paragraph 3.5-Connections.

1.4 Command/Display Orientable Module

This Module of original design is located on the right side of the Hot Plate top panel, and comprises a graphic display and a command keyboard.

The multifunction liquid-crystal graphic-display monitors the temperature in 0.1°C steps and shows the reaction time in 0.1 s increments, both sets of figures in large highly readable format.

Moreover, the graphic display presents all available commands: the operator sets the experiment configuration via the commands keyboard located below the display.

The module can be oriented to obtain a better view of the display.

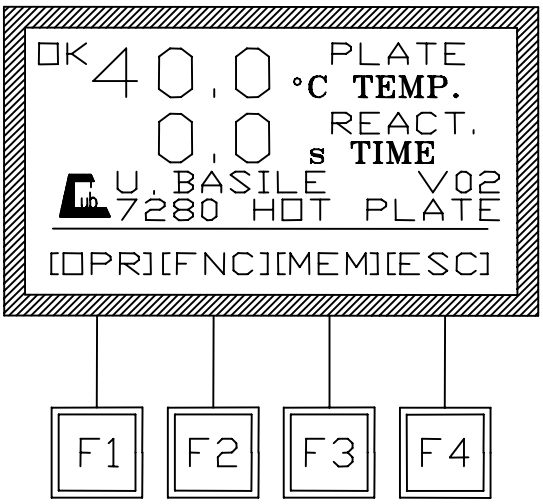
1.4.1 Graphic Display

It is basically divided into three levels of characters:-

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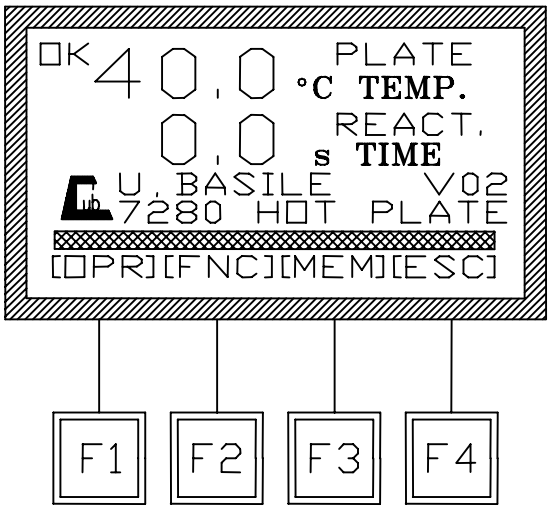
The **upper level** shows on two strings the temperature and the reaction time, in large characters.

The **intermediate level**, in medium size characters on a single line or in small characters on two lines, generates “information strings” which monitor the status of the instrument and supplies date, time, animal sequence, experiment number,, etc.



The **lower level**, divided by a **horizontal line**, indicates in square brackets the function of the keys **F1**, **F2**, **F3** and **F4.**

The horizontal line becomes a **bar** when the heater is on.



1.4.2 Keyboard

The keyboard consists of 4 soft push-button keys **F1**, **F2**, **F3** and **F4**, the function of which depends on the software sub-routine and is clearly indicated on the lower level of the display, see paragraph 1.4.4 for reference.

Each function menu has in fact a different sub-routine software, which is entered when the corresponding function key is depressed. If a key is kept depressed more than one second, the command is repeated at a higher speed.

1.4.3 F4 Key

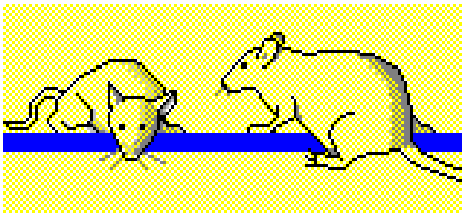
The **F4 key**, which has the function of **ESCAPE** key, enables the operator to leave a menu and go back to a previously selected one.

If depressed more times from the main menu, F4 shows in sequence, in the intermediate level of the display:

- the **UGO BASILE logo** and the **software release number** (for example V01)

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- **date and time**
- **actual temperature** of the plate plus latency time
- **set temperature** plus latency time
- the Ugo Basile mice



The F4 loop, then comes back to the main menu, showing the Ugo Basile logo.

1.4.4 Function Key Abbreviations

All function keys are indicated on the graphic display by abbreviations, meaning:-

(ADD)	set instrument address
(ALL)	all (serial + printer)
(B-R)	baud rate
(CHR)	chronometer menu
(CLK)	clock setting
(DAT)	date setting
(DIS)	display contrast
(ENT)	enter
(ESC)	escape (see paragraph 1.4.3)
(FNC)	function menu
(FTR)	feature menu
(MEM)	memory menu
(NO)	no
(NUL)	annulment
(OK)	enter
(OPR)	operation menu
(OUT)	out
(PAT)	output path (PC and/or printer)
(PLT)	plate temperature
(PRN)	data printing selection
(RES)	data memory reset
(SER)	serial (PC) path
(SET)	set temperature
(TIM)	time setting
(V.W)	data view
(YES)	yes

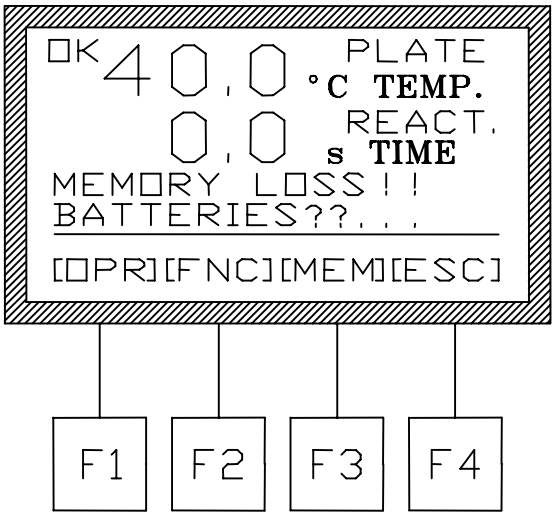
See also the **FUNCTION KEY BLOCK DIAGRAM, 7280-281ES06**, in the section “WIRING DIAGRAMS”.

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1.4.5 Memory Loss!

In case the caption “MEMORY LOSS!! BATTERIES??” appears on the display, it means that the internal watch-type batteries which maintain the memory, are down and consequently have to be replaced.

The data saved in the memory are lost. Once the batteries have been replaced, the operator has to set again date, time (see paragraph 6.2) and the experiment configuration including sequence number, etc., see paragraph 4.4.



NOTE : When the caption “MEMORY LOSS!! BATTERIES??” appears, the 7280 internal memory is lost. To avoid the loss of relevant data, we suggest to save them on the PC or to print them before exiting any experimental session**.**

2 DATA ACQUISITION

The 7280 Hot Plate is a microprocessor controlled unit featuring direct connection to the PC to which the experimental data, stored in the 7280 internal memory and shown on its graphic display, can be routed.

The Delta 9-pin connector located on its back panel (labelled **TO PC RS232C**, see paragraph 3.5-Connections) enables the operator to connect it directly to the serial port RS 232 C of the PC, for communication via the optional **Win-DAS Software Cat. 2010**.

The 2010 is a Windows® based Data Acquisition Software Package, which enables the research worker to store the data into individual files, ready to be easily managed by most statistical analysis packages available on the market. **Ask for details!**

3 INSTALLATION

3.1 Unpacking & Preliminary Check

Check the contents of the shipment for completeness, packing list to hand, and visually inspect the instrument as soon you take it out of the packaging. Use the ***Check List*** supplied.

If the instrument is damaged or, after having tested it, fails to meet rated performances, notify the carrier and our company immediately.

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Once the Hot Plate is assembled, do not attempt to lift or move the combined unit. In particular, do not incline the base, as the Perspex restrainer may accidentally come off the plate.



Protect the environment!

Dispose of packaging properly, according to existing and applicable waste management rules and regulations.

3.2 Notes on the Instruction Manual

The 7280 Instruction Manual included in the Basic Unit package is necessary for the correct installation and operation of the instrument.

We recommend to keep the manual in good conditions, ready to be consulted by the qualified personnel who use the instrument.

Free of charge copies of the instruction manual are available upon request: please contact our service department (see paragraph 8.6-Customer Support) specifying the series number of your instrument.

3.3 Assembling the Instrument

Assemble the instrument on a stable and reasonably flat bench or table surface. Position on the heating plate one of the two animal restrainers supplied with the instrument.

3.4 Before Applying Power

Take a look at the Power Module, on the right of the Hot Plate back-panel, which encompasses – from left to right - the inlet connection of the mains cord, the mains switch and the fuse holder/voltage selector.

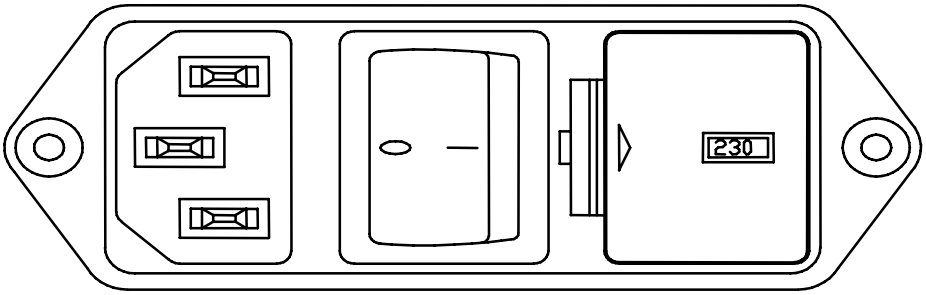


Figure 2 "Power Module"

3.4.1 Mains Switch

This two-pole toggle switch, which complies with international safety standards, provides a visual cue, meaning:-

- **OFF** when pressed to the right ("**O**" side)
- **ON** when pressed to the left ("**I**" side)

3.4.2 Fuse Holder & Voltage Selector

The fuse holder comprises two fuses, one on the live, and the other on the neutral. For operation at 220-230 Volts, we recommend 400 mA timed fuses (type T400). Use 800 mA fuses (type T800) for operation at 115 Volts. To replace the fuses, see paragraph 8.1-Electrical.

The fuse holder also embodies the Voltage Selector. Make sure that the flag indicates the correct voltage (i.e., the voltage of your mains).

To change the selected voltage, see paragraph 8.1.

3.4.3 Mains Cord

It is a standard cable, Cat. # E-WP008. Make sure your power outtake is provided with a reliable ground connection, see also 3.5 & 3.6.

3.5 Connections

Connect the mains cord to a power outtake, ***provided with a reliable earth connection***, protected by a differential earth-leakage switch (CGFI) that breaks at the threshold of 0.03A, within a max. acceptable delay of 1s. The maximum breaking compliance required by the CGFI is10kA at rated current is 6A.

The back panel (see paragraph 1.3 and Figure 1) also embodies three connectors, labelled:

PEDAL SWITCH: this low voltage connector is used for the pedal-switch. Insert the male connector of the pedal switch cable until it locks into its socket; a "click" confirms it is locked.

MINIPRINTER: the 20-pin connector enables the connection of the Mini Printer Cat. 7145 to the Hot Plate, see also paragraph 11.

TO PC RS232C: this delta 9-pin connector enables the operator to connect the Hot Plate to the serial port RS232C of the PC or to the Multiserial Interface Cat. 2700, see paragraph.

Mismatching the connection is prevented by a different pin arrangement.

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3.6 Additional Safety Consideration

UGO BASILE DOES NOT ACCEPT ANY RESPONSIBILITY FOR PROBLEMS OR HARM CAUSED TO THINGS OR PERSONS ARISING FROM:

- INCORRECT ELECTRICAL SUPPLY;
- INCORRECT INSTALLATION PROCEDURE;
- INCORRECT OR IMPROPER USE OR, IN ANY CASE, NOT IN ACCORDANCE WITH THE PURPOSE FOR WHICH THE INSTRUMENT HAS BEEN DESIGNED AND THE WARNINGS STATED IN THE INSTRUCTION MANUAL SUPPLIED WITH THE INSTRUMENT;
- REPLACEMENT OF ORIGINAL COMPONENTS, ACCESSORIES OR PARTS WITH OTHERS NOT APPROVED BY THE MANUFACTURER;
- SERVICING CARRIED OUT BY UNAUTHORIZED PERSONNEL.

a. Place your Hot Plate on a steady flat surface (e.g. your experimentation table).

b. Do not obstruct free and comfortable access to the power module.

c. Use original accessories and spare parts only, see also paragraph 9-ORDERING INFORMATION.

d. Immediately disconnect and replace a damaged mains cable.

e. Do not use in hazardous environments or outside prescribed environmental limitations (i.e. +10C° / +40C°, 95% relative humidity, non-condensing), see also paragraph 9.2-Specifications.

f. Do not spray any liquid on the connectors; see also paragraph 8-MAINTENANCE.

g. Keep inflammables far from the 7280 heating plate.

4 OPERATION

4.1 Switching On

Switch on the 7280 by acting on the Mains Switch placed on the back side of the instrument; see paragraph 1.3.1 & Figure 1. The software takes some seconds to perform a complete checking of the electronic circuit. During the checking, the display shows the software version which is actually installed, e.g., "*V01*", which appears on the right side of the screen, at the intermediate level, see paragraph 1.4.1.

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It is important to let us know the software version, in case of any operational or servicing problem.

After 3 seconds the display shows the configuration of the previous experiment, saved in the internal memory of the microprocessor; which is fed by two watch-type batteries.

In case the caption **MEMORY LOSS!! BATTERIES?** appears on the display, please refer to paragraph 1.4.5.

4.2 Working Temperature

Select a working temperature, taking into account what indicated in the literature, the drug administered, if any, the type of experiment you are supposed to carry out.

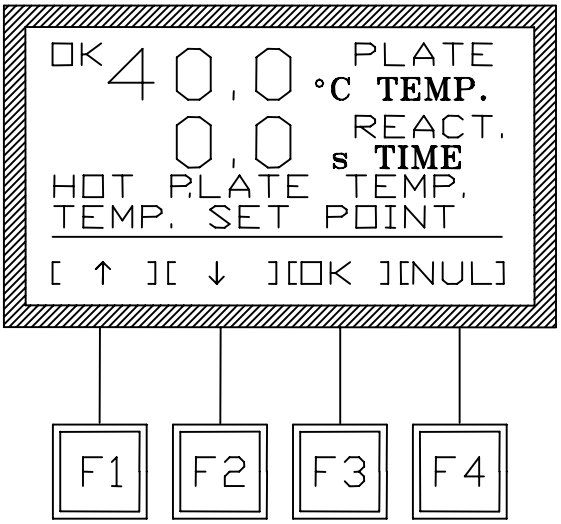
Depress the F1 key **(OPR)** from the main menu. The display will show two different options:-

F1 **(CHR)** start and stop the chronometer

F2 **(PLT)** plate menu

Depress the F2 **(PLT)** key followed by F1 **(SET)**.

Adjust the temperature to the desired value by acting on the F1 **(↑)** or F2 **(↓)** keys. A momentary action will increase the set temperature of one step, corresponding to 0.1°C. The set temperature appears on the display.



By keeping F1 or F2 depressed the operator can set the desired temperature (increasing or decreasing it) at a higher speed.

Once the desired temperature has been set, depress the F3 **(OK)** key to confirm or the F4 **(ESC)** to go back to the main menu, leaving the temperature unaltered. In a matter of 5-10 minutes the plate temperature will reach the preset value.

4.3 Carrying out the Test on the Animal

Drop the animal onto the plate, and immediately **depress the pedal switch**. A momentary action is sufficient. The latency time display starts.

When the threshold of pain is reached, the animal licks its paws according to an easily identifiable stereotype behaviour. At this point, **depress again the pedal switch**, read the **reaction time (LATENCY TIME**), report it and remove the animal from the plate.

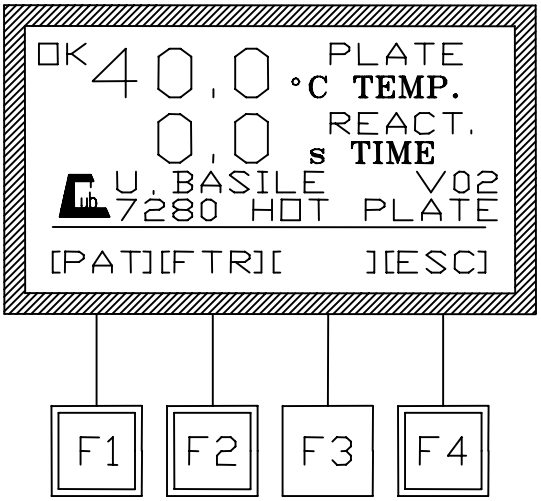
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The datum shown on the display can be printed on the Mini-Printer or routed to the PC, see paragraph 12-OPERATING IN CONJUNCTION WITH MINI PRINTER AND/OR PC.

We recommend to absorb with cotton wool any occasional large emission of urine during familiarization or test time. A plantar surface, if wet by urine, will be definitely less sensitive to the thermal stimulus because of the large specific heat of any watery solution.

4.4 How to Set a Customized Experimental Configuration

From the main menu, depress the **F2 (FNC)** key, followed by the **F1 (OUT)** key. Depress again the key **F2 (FTR)**; the display shows:-



This function enables the operator to personalise the basic datum, by adding:

- **sequence number** (see 4.4.1)
- **experiment number** (see 4.4.2)
- **sex of the animal** (see 4.4.3)

All the available selections for each additional information are displayed in a loop, on the right of the medium level of graphic display.

Scan them by the **F1 (↑)** or **F2 (↓)** keys, select the suitable one and confirm the selection by depressing the F3 **(OK)** key, or avoid one or more features by depressing the F4 **(NUL)** key.

By depressing the arrow keys shortly, the numerical value will increase or decrease of one step. By keeping them depressed longer, the selection can be made at higher speed.

The selected features will be kept in the hot Plate memory even if the instrument is turned off.

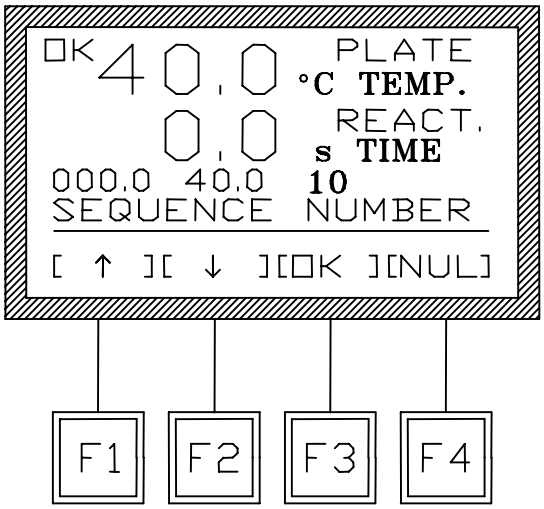
To erase one or more features previously set, simply enter this software level, highlight the concerned feature and depress the **F4 (NUL)** key.

After entering the last feature (M or F), the software goes automatically back to the main menu.

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4.4.1 Sequence Number

The first additional information to be defined is the sequence number. This section is highlighted as soon as the F2 **(FTR)** key is depressed. Use the F1 **(↑)** or F2 **(↓)** keys to set the desired sequence number **from 01 to 99** and confirm it by depressing the F3 **(OK)** key.



The sequence number will automatically increase by one figure at any subsequent measurement.

It trips once a datum has been acquired and recorded, indicating the fresh sequence number ready for the next measurement.

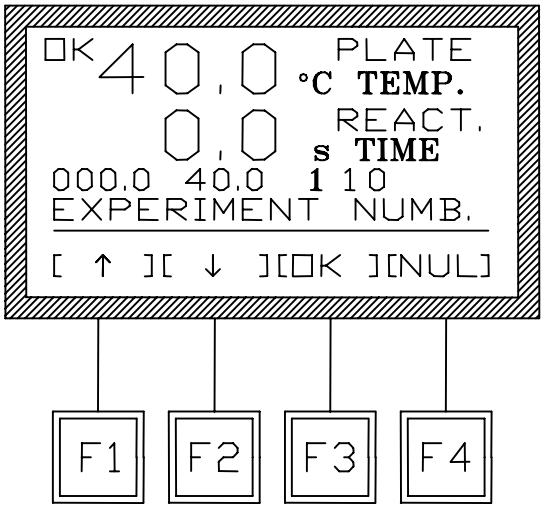
If a sequence number is not necessary, depress the **F4 (NUL)** key.

IMPORTANT: when a fresh experimental session is begun, the sequence number can be carried on from the number reached at the end of the previous trial or a new number can be entered, following the instructions outlined above, for example starting from 01.

4.4.2 Experiment Number

As soon the **F3 (OK)** or **F4 (NUL)** keys are depressed, the second option is highlighted.

The experiment number, **from 1 to 9**, can now be selected via the **F1 (↑)** or **F2 (↓)** keys and confirmed via the **F3 (OK)** key or avoided by the **F4 (NUL)** key.



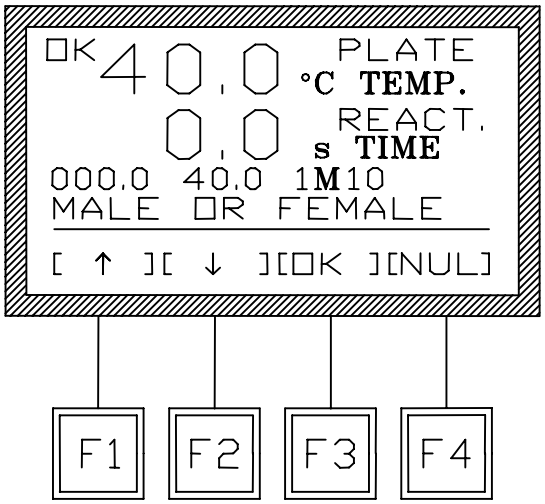
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4.4.3 Animal Sex

After the experiment number, it is possible to define the sex of the animal which has to be processed.

Select it by depressing the **F1 (↑)** or **F2 (↓)** keys and confirm it via the **F3 (OK)** key.

The user can avoid to select the sex by depressing the **F4 (NUL)** key.



5 OPERATING IN CONJUNCTION WITH MINI PRINTER AND/OR PC

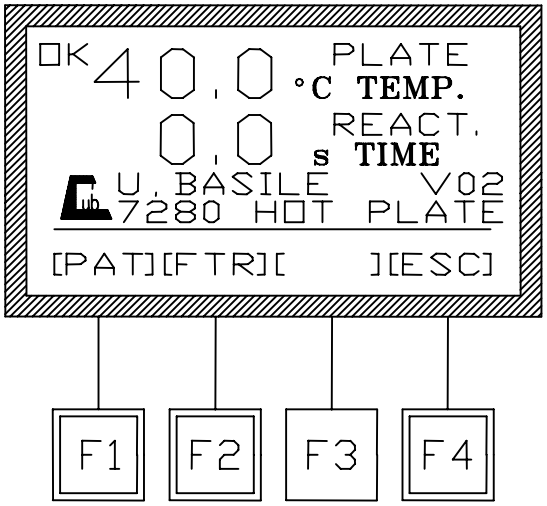
5.1 How to Set the Data Output Path

The experimental data are normally saved in the 7280 internal memory. During the experimental trial, the data can also be printed-out in real time via the optional 7145 Thermal Mini-Printer or routed to the PC for real-time or remote communication.

In case of operation in conjunction with the Mini-Printer or with the PC, the operator has to select the data output path menu.

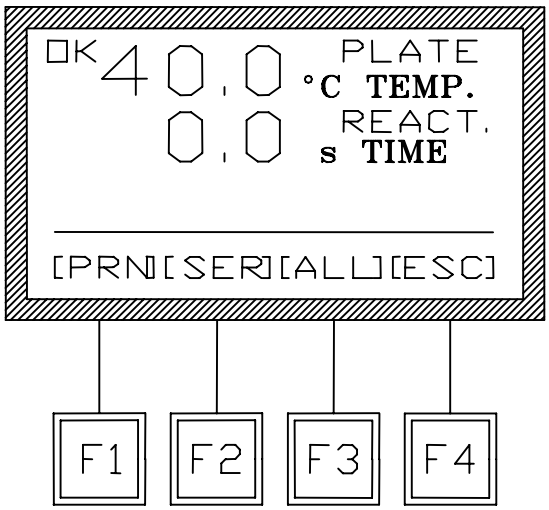
From the main menu, depress **F2 (FNC)** key, followed by the **F1 (OUT)** key.

The display shows:



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Depress now the **F1 (PAT)** key; the display will show:



Select now the **F1 (PRN)** key to print the data in real time on the 7145 Thermal Miniprinter (see paragraph 11).

The **F2 (SER)** key allows direct connection to the PC for exporting the experimental data in real time or in remote conditions.

Serial communication between the 7280 Hot Plate and an IBM (or compatible) PC is owned by the Ugo Basile Win-DAS Windows®-based software supplied as optional (see 9.1)

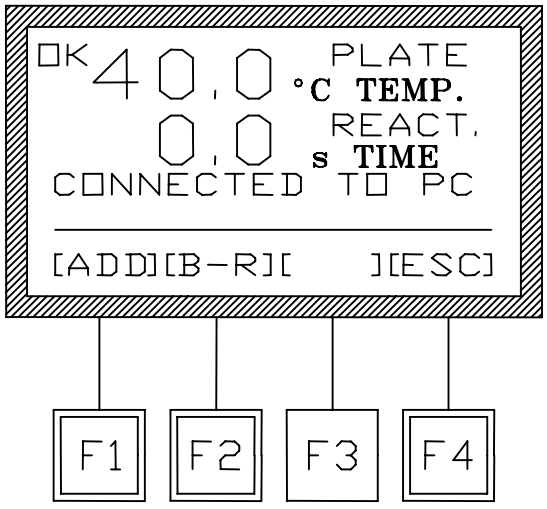
Ask for details: a free demo diskette is available!

The **F3 (ALL)** key enables the researcher to select both output paths (to Mini-Printer and to PC) simultaneously.

In case the operator wants to **cancel one of the previously activated choices** (PRN, SER or ALL), it is necessary to enter the PATH menu and depress the **F4 (ESC)** key, selecting no option.

5.1.1 Instrument Address and Baud-Rate

When the SER or ALL functions are activated, the PC must be correctly connected to the 7280; the correct connection is confirmed by the following message: “CONNECTED TO THE PC” appearing on the display.



From this menu, the operator can set the address of the Hot Plate which is routing data to the PC and the communication speed (baud-rate).

The **default address is 01** and the **default baud-rate is 300**.

The factory set parameters are suitable in most cases; in this case the operator can leave this menu by depressing **the F4 (ESC)** key.

To modify the **address**, if necessary, press the **F1 (ADD)** key; select by the up or down arrows the desired address (**from 01 to 99**) and then depress the **F4 (ESC)** key.

To change the factory set baud-rate, depress the **F2 (B-R)** key. Select by the arrows the desired value in the loop which includes **300** - **600** - **1200** - **2400** - **4800 Bps**. Then depress the **F4 (ESC)** key.

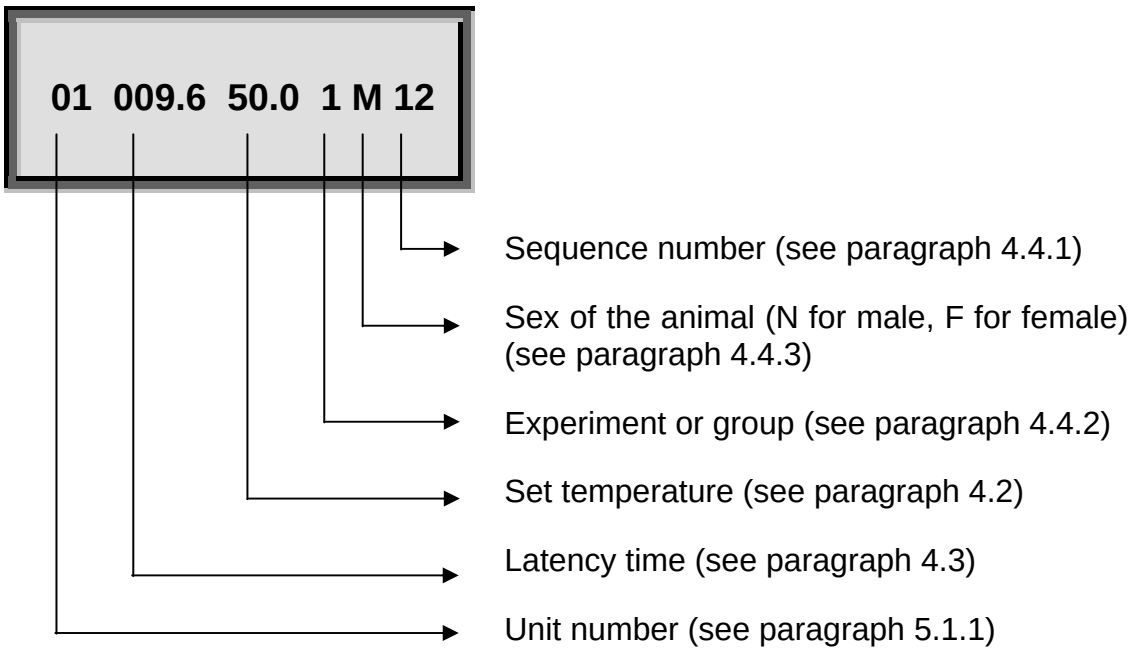
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To baud-rate must be identical to the value set on the Win-DAS software (see 2010 manual).

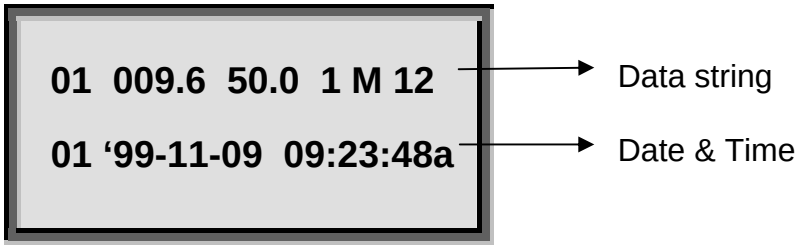
5.2 Datum Format

When the data are routed to the PC via the Win-DAS Data Acquisition Software (see its instruction manual), they can be monitored on the "UB Server" window, each string beginning with the address of the instrument to which the print-out refers. The address may be 01 (default) or other (preset by the operator), see paragraph 5.1.1.

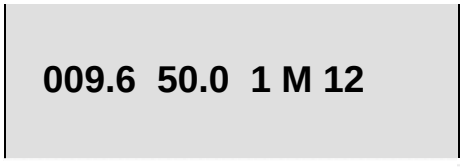
The following is a sample of the datum, as it appears on the PC:-



If the operator has selected the combination of the experimental datum with date and time (see paragraph 6.2-Setting Time & Date), this information appears on a second line.



When the data are printed by the 7145 Miniprinter, the address of the instrument to which the print-out refers is omitted.



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5.3 Quick setting of the 7280 Hot Plate

This Instruction Manual extensively explains how to take advantage of all the features offered by this microprocessor controlled unit.

The following table summarizes them; however, we recommend you to browse the complete manual to go deep into details.

Each sequence of commands is described starting from the MAIN MENU.

Command Description	*Command Sequence*	*Paragraph reference*
Set display to show **DATA** in progress	Repeat **(ESC) (F4)** key until the configuration is reached	*1.4.3*
Set **Printer ON**	**(FNC)** - **(OUT)** - **(PAT)** - **(PRN)**	*5.1*
Print DATA previously saved in the 7280 memory	**(MEM)** - **(OUT)** - **(YES)/(NO)** to combine or not Time & Date - **(PRN)**	*6*
Send DATA previously saved in the 7280 memory **to PC**	**(MEM)** - **(OUT)** - **(YES)/(NO)** to combine or not Time & Date - **(SER)**	*6*
Set **TIME**	**(FNC)** - **(CLK)** - **(TIM)** - **(↑)/(↓)** to set the correct time - **(ENT)**	*6.2*
Set **DATE**	**(FNC)** - **(CLK)** - **(DAT)** - **(↑)/(↓)** to set the correct date - **(ENT)**	*6.2*
Set **DISPLAY CONTRAST**	**(FNC)** - **(DIS)** - **(↑)/(↓)** depressed until the desired contrast is reached - **(ESC)** - **(ESC)**	*6.3*

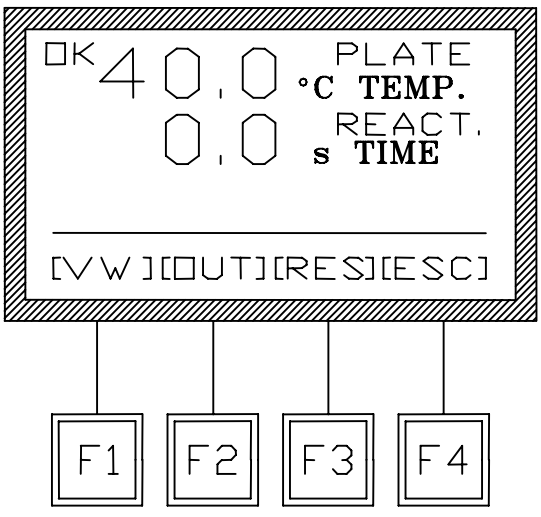
While the experiment is in progress, if properly set by depressing the F4 key from the Main Menu), the display shows the incoming data in real time.

6 MEMORY MANAGEMENT

Each datum, no matter whether printed or sent to the PC, is saved in the memory which can store about 500 strings, including the datum proper and the date/time indication.

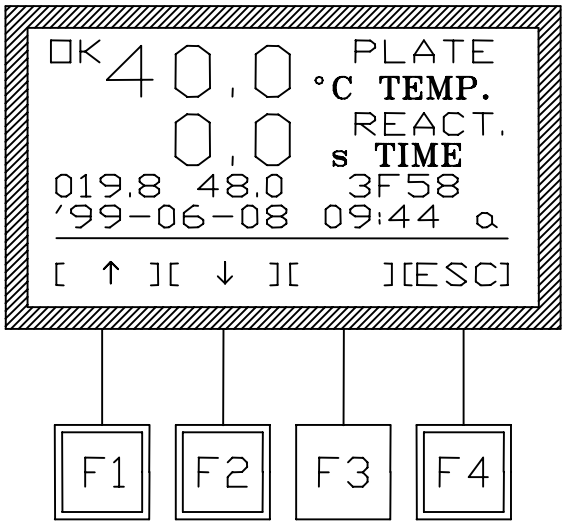
By depressing the **F3 (MEM)** key from the main menu, the **MEMORY** Menu can be reached.

The **F1 (VW)** key enables the operator to visualize on the display the Data stored in the memory, each datum complete with acquisition Date & Time.



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Use the vertical-arrow keys **F1 (↑)** or **F2 (↓)** to scan the data; by momentarily depressing the key, the displayed datum will increase (or decrease) of one measurement. Keeping these keys depressed longer will scan the data at higher speed.

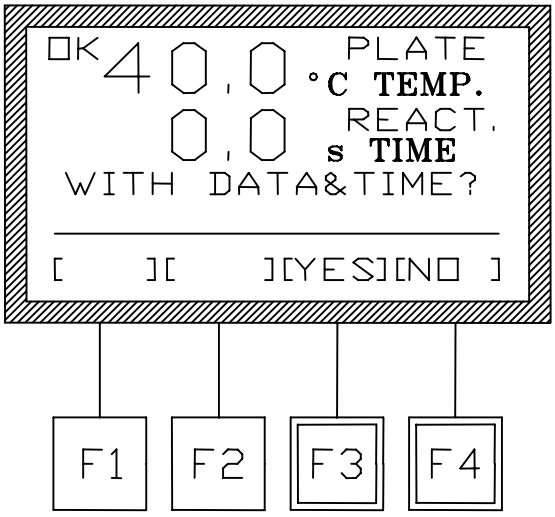


As usual the F4 **(ESC)** recalls the previous menu software or abandons a wrong selection.

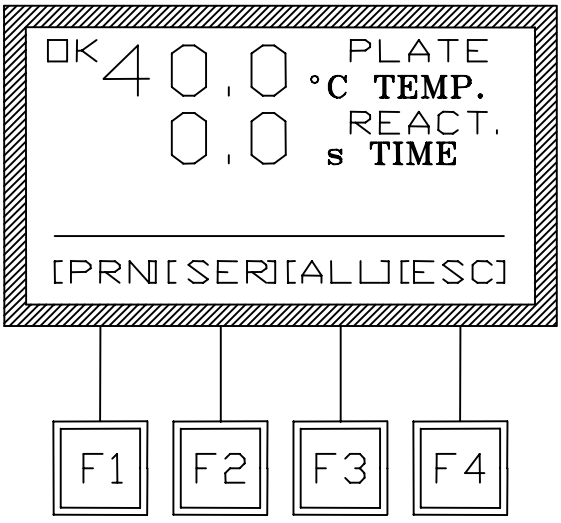
From the **MEMORY** Menu, the **F2 (OUT)** key enables the researcher to export the data stored in the memory to the PC or to print them on the Mini-Printer.

Before selecting the output, the operator will be asked if he/she is interested to combine each datum with te related Date & time, by answering **(YES)** (**F3** key) or **(NO)** (**F4**) to the question “WITH DATE & TIME?”

If the researcher selects the combined printing, the time and date will appear on the second line, see paragraph 5.2-Datum Format.



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The researcher can now select the data output path, see paragraph 5.1.

To interrupt the print-out response of the stored Data, depress the **F4 (ESC)** key for one second at least.

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Before starting a new experimental session, we suggest to check the memory which may contain some data of the previous trial. If it is the case, enter the proper software level and RESET the memory.

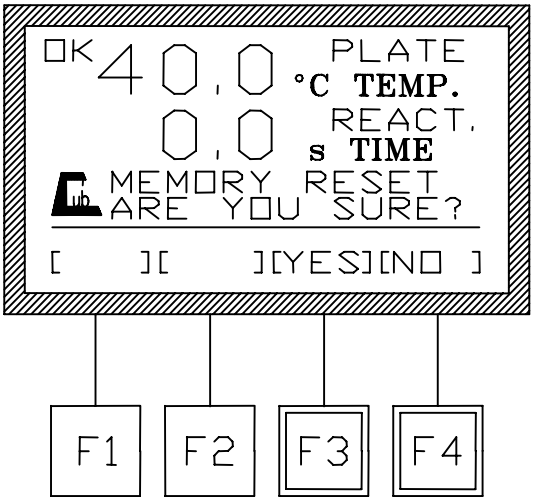
6.1 Memory Reset

From the Memory menu, the F3 key **(RES)** enables the operator to reset the data stored in the memory.

This command can be useful, for instance, before starting a new experimental session, if the operators prefers to cancel the data saved from previous experiments.

The operator is now required to answer **(YES)** (**F3** key) or **(NO)** (**F4** key) to the question: "are you sure?". This further question has been added to avoid the accidental loss of all stored data.

The Memory menu automatically appears also when the memory is fully loaded, which means it has reached its maximum capability of about 500 lines.



6.1.1 "Memory Full" Message

If the "**MEMORY FULL**" message appears during acquisition, the operator has three options:-

1) the researcher who is not interested in considering the data saved in the memory, may simply depress the **F3 (RES)** key and confirm the reset by answering **F3 (YES)** to the question "ARE YOU SURE?", see paragraph 6.1.

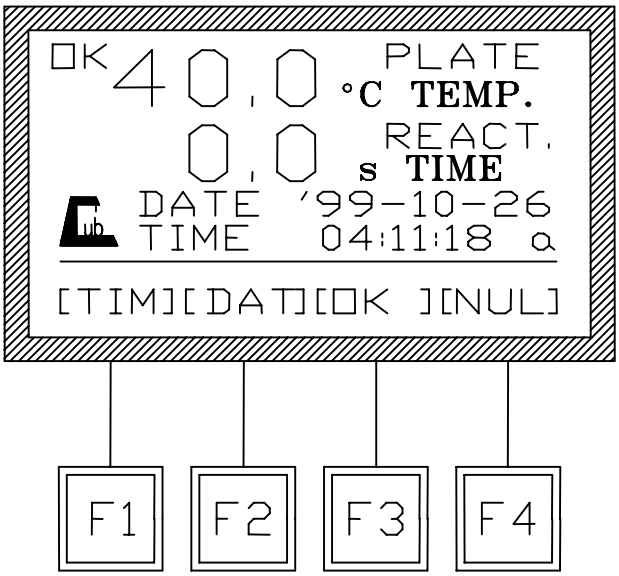
2) in case the data previously saved in the memory are necessary, proceed in order to Print and/or send them to PC as previously explained (see paragraph 6-MEMORY MANAGEMENT)

3) there is also the possibility to ignore the indication of "MEMORY FULL" and go on with the experiment by depressing the **F4 (ESC)** key. The data acquired onwards will not be saved. Consider that, in this case, the memory remains fully loaded and the display reminds it by showing the message "MEMORY FULL" each time the 7280 is switched ON.

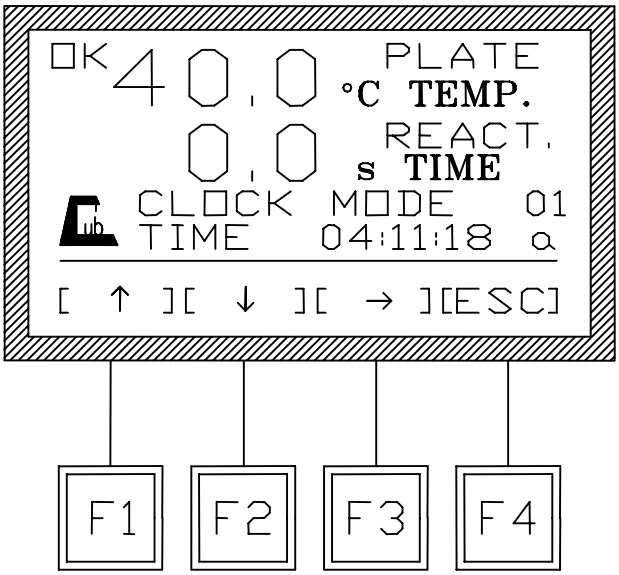
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6.2 Setting Time & Date

To set time and date, from the Main menu depress the **F2 (FNC)** key, followed again by the **F2 (CLK)** key.



Select F1 **(TIM)** to set TIME. Use the F3 horizontal arrow key to highlight, on the intermediate level of the diplay, the time section (hours, minutes, seconds, mode) which has to be modified.



Now use the vertical-arrow keys F1 **(↑)** or F2 **(↓)** to set the correct time; a momentarily action on the keys will increase or decrease the numerical value of one step: depress the keys longer for higher speed selection.

Remind also to set the clock mode, selecting among the following possibilities:-

00 = 24-hour mode

01 = anti-meridian (a.m.) time

02 = post-meridian (p.m.) time

Once the **TIME** setting is completed, depress the F4 **(ENT)** key to save the setting and go back to the Main Menu.

Follow the same procedure to set the **DATE**, selecting the now the F3 **(DAT)** key. Enter also the **DAY OF THE WEEK**, referring to the following table:-

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01 = **Monday**

02 = **Tuesday**

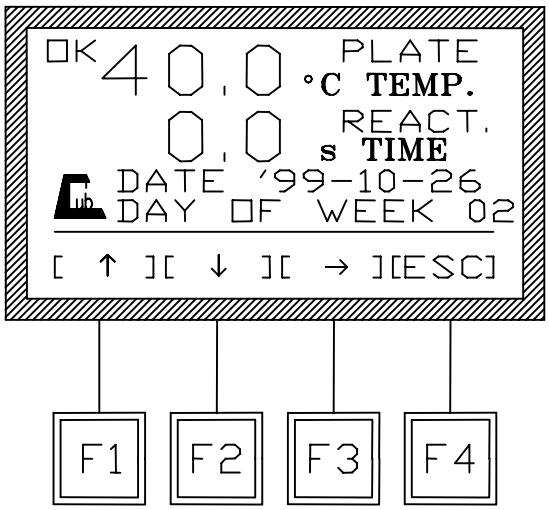
03 = **Wednesday**

04 = **Thursday**

05 = **Friday**

06 = **Saturday**

07 = **Sunday**

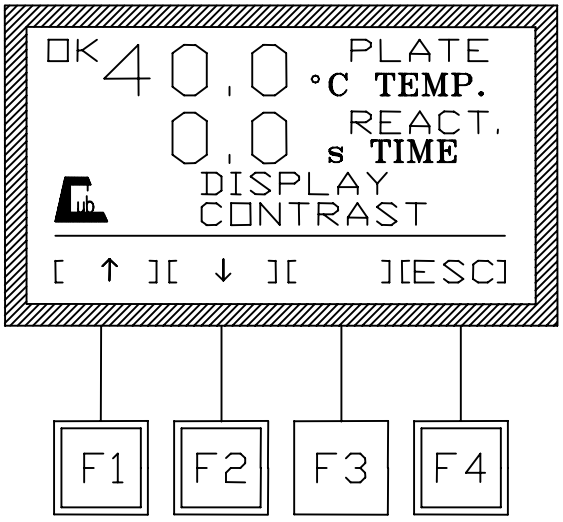


Depress the F4 **(ENT)** key to confirm the selection.

6.3 Display Contrast

To modify the display contrast, depress the F2 **(FNC)** key from the Main Menu, then the F3 **(DIS)** key.

The display shows:



Keep the arrow keys F1 **(↑)** or F2 **(↓)** depressed until you reach the desired display contrast.

The readability of the liquid crystal display depends on the angle of view: select the ideal contrast according to the height of the table, the operator's distance and so on.

Find the ideal readability combining display contrast and module orientation.

Please note that the display brightness can slightly vary with use, due to the instrument temperature; if necessary, retouch it.

Leave this software level, saving the selected display contrast, by depressing the F4 **(ESC)** key.

7 CALIBRATION

Each Hot Plate is factory calibrated to ensure years of trouble-free operation.

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A dedicated software menu ensures an offset correction of the plate temperature which – however - has be carried out, if necessary, by our technical department only; see paragraph 8.6-Customer Support.

8 MAINTENANCE

While any service of the instrument is to be carried out by Ugo Basile personnel or by qualified personnel, authorized by UGO BASILE organization, this section of the instruction manuals describes normal maintenance procedures which can be carried out at the customer's facilities.

> ! ***UNPLUG THE MAINS CORD BEFORE CARRYING OUT ANY MAINTENANCE JOB!***

8.1 Electrical

The Wiring Diagrams illustrate the simple circuit of the Controller 7371.

To inspect and/or replace the fuses, **disconnect the mains cable first!** Insert a miniature screwdriver in the slot indentation, see paragraph 3.4, and snap out the slide which houses the fuses.

For operation at 220-230 Volts, we recommend 400 mA timed fuses (type T400). Use 800 mA fuses (type T800) for operation at 115 Volts.

Having extracted the fuse slide, the Voltage selector becomes accessible. The same miniature screwdriver will help you to pry out the cross jumper on which the operation voltage is engraved. Place the jumper upside down if you have to shift from 115 to 230V or vice versa.

Snap in the fuse slide: the mechanical "*click*" ensures that it is locked. Check the voltage flag before applying electrical power.

8.2 Basic Unit

The heating plate is very resistant to watery solutions splashes and is not corroded by rodent urine.

Don't use organic solvents for cleaning: they may spoil the enamelled panels of the base box. A moistened cloth is adequate for dusting and removing the animals' droppings.

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8.3 Perspex Restrainers

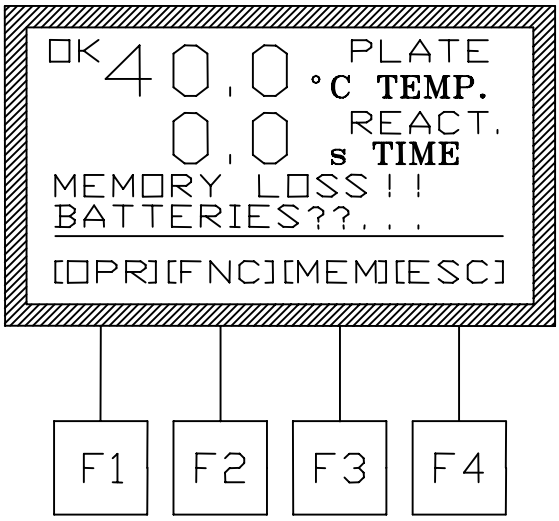
Organic solvents should not be used for cleaning the two Perspex restraining cylinders as they will definitely “craze” the acrylic material.

This means to originate a network of superficial cracks, due to the release of internal stress. These cracks will not degrade the mechanical sturdiness of the cylinders, but will definitely spoil the neat look of the tubes and decrease their transparency, hence impairing the observation of the animals.

8.4 Battery Replacement

The Hot Plate memory is supported by two watch-type batteries **Silver 1.55V SR43W**. Always use the same type of batteries for replacement.

When the batteries are down, the display shows:-



Switch off the Hot Plate and disconnect the mains cable., see note below.

Remove the 4 screws which fasten the right panel (front view, display side)

The Circuit Block is fixed on the panel. Detach the panel/circuit block, paying attention to the GROUND contact (faston), which has to be disconnected.

Extract the panel/circuit block carefully. The batteries are located on the electronic board; **replace the batteries.**

Reconnect the GROUND contact and reassemble the panel/circuit block .

NOTE : When the caption “MEMORY LOSS!! BATTERIES??” appears, the 7280 internal memory is lost. To avoid the loss of relevant data, we suggest to save the them before exiting any experimental session.

8.5 Long Inactivity

The instrument does not require any particular maintenance after long inactivity, except cleaning.

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8.6 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Hot Plate, please do not hesitate to get in touch with our local distributor or with our **service department** at:-

UGO BASILE
Viale G. Borghi 43
21025 COMERIO – Varese, ITALY

Phone : +39 0332 744574

Fax : +39 0332 745488

e-mail : service@ugobasile.com

Before sending any instrument to our factory for repair, we recommend you to get in touch with our service department to obtain a return authorization number (R.A.N.) and shipping/packing instructions.

We may not be held responsible for damages during transport due to poor packing. Whenever possible, please use the original packing.

9 ORDERING INFORMATION

7280 **HOT PLATE**, new microprocessor controlled unit, standard package, including following standard accessories:

7281 Basic Unit, incorporating Heating Plate & Command/Display Orientable Module

7283 Pedal Switch/Cable/Connector Assembly

7284 Perspex Restrainer (for Mice)

7285 Perspex Restrainer (for Rats)

7286 Instruction Manual

E-WP008 Mains Cable

Set of 2 fuses for either 115 VAC or 230 VAC mains

9.1 Optional

2010 Win-DAS software package, version for Windows®

7145 Thermal Mini Printer (see also paragraph 11)

2605 Package of 10 Heat Sensitive Paper Rolls

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9.2 Specifications

Commands	:	via “soft keys”
Read-out	:	multifunction graphic display
Print-out	:	by optional thermal mini-printer
Starting	:	via pedal switch or soft keys.
Plate Temperature	:	adjustable in the range 30.0-63.9°C via “soft keys” (in 0.1°C steps)
Reaction Time	:	displayed on the graphic display, in 0.1s steps
Connection to PC	:	through DELTA 9-pin connector. See paragraph 3.5.
Power Requirement	:	115 or 230 V, 50/60 Hz, 75 W max.
Operating Temperature	:	15° to 30° C
Sound Level	:	< 70 dB (A)
Dimensions (without restrainer)	:	cm 40 (w) x 26 (d) x 12 (h)
Rat Restrainer	:	cm 20 (diam.) x 31 (h)
Mouse Restrainer	:	cm 20 (diam.) x 18 (h)
Weight	:	6.00 Kg
Shipping Weight	:	12.00 Kg approx.
Packing Dimensions	:	66 x 50 x 40 cm

10 BIBLIOGRAPHY

10.1 Method

- Nathan B. Eddy & Dorothy Leimbach: "**Synthetic Analgesics. II. Dithienylbutenyl- and Dithienylbutylamines**" J. Pharmacol. Exp. Therap. 107: 385-393, **1953**.

10.2 Paper Dealing with UB Hot Plate

- G. Laviola & E. Alleva: "**Ontogeny of Muscimol Effects on Locomotor Activity, Habituation, Pain Reactivity in Mice**" Psychopharmacology 102: 41-48, **1990.**

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11 7145 MINI-PRINTER

11.1 General

The **Mini-Printer 7145** is a thermal array device, supplied as optional part, suitable to print experimental data on its 58mm wide paper.

It basically consists of a printed circuit board, mounted on a plastic support, which includes the front panel and the lodging for a printing mechanism and a paper roll. The whole is inserted in a Perspex cabinet.

See also the 7145 leaflet for reference:-

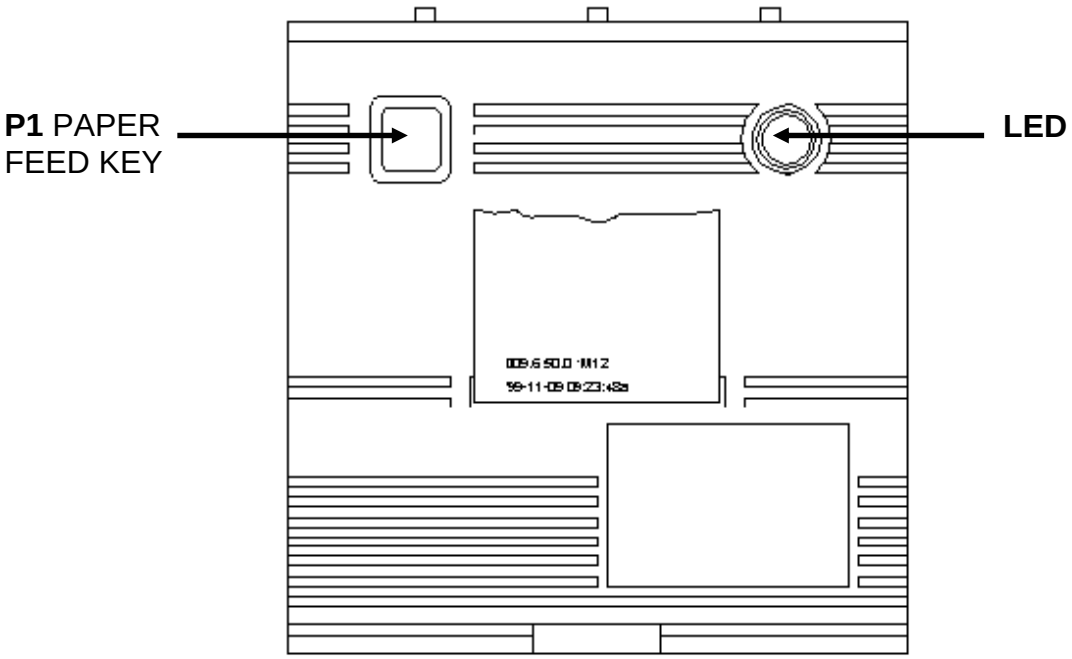


Figure 3 "Mini Printer Panel"

11.2 Mini-Printer Operation

See paragraph 3.5 for connection to the Hot Plate, via the 20-pin cable cat. 7178 provided with the Mini-Printer.

The Mini-Printer is automatically switched on when the cable is connected. A LED on the front panel indicates that the power is on.

Follow the instructions outlined in paragraph 5.1-How to Set the Data Output Path for the setting of the mini-Printer on the Hot Plate.

A red key (P1, see Figure 3 "Mini Printer Panel") for paper feeding is provided on the front panel.

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The same key, kept depressed for some seconds when switching on the printer, enables the operator to carry out an **autotest**.

11.3 Paper Loading

Changing the paper roll is a very simple business:-

a) The printer must be “ON”, i.e., connected to the Hot Plate.

b) Open the lid by lifting it with your nail, acting on the front indentation.

c) The roll is placed on the lodging rectangular space on the back of the mechanism.

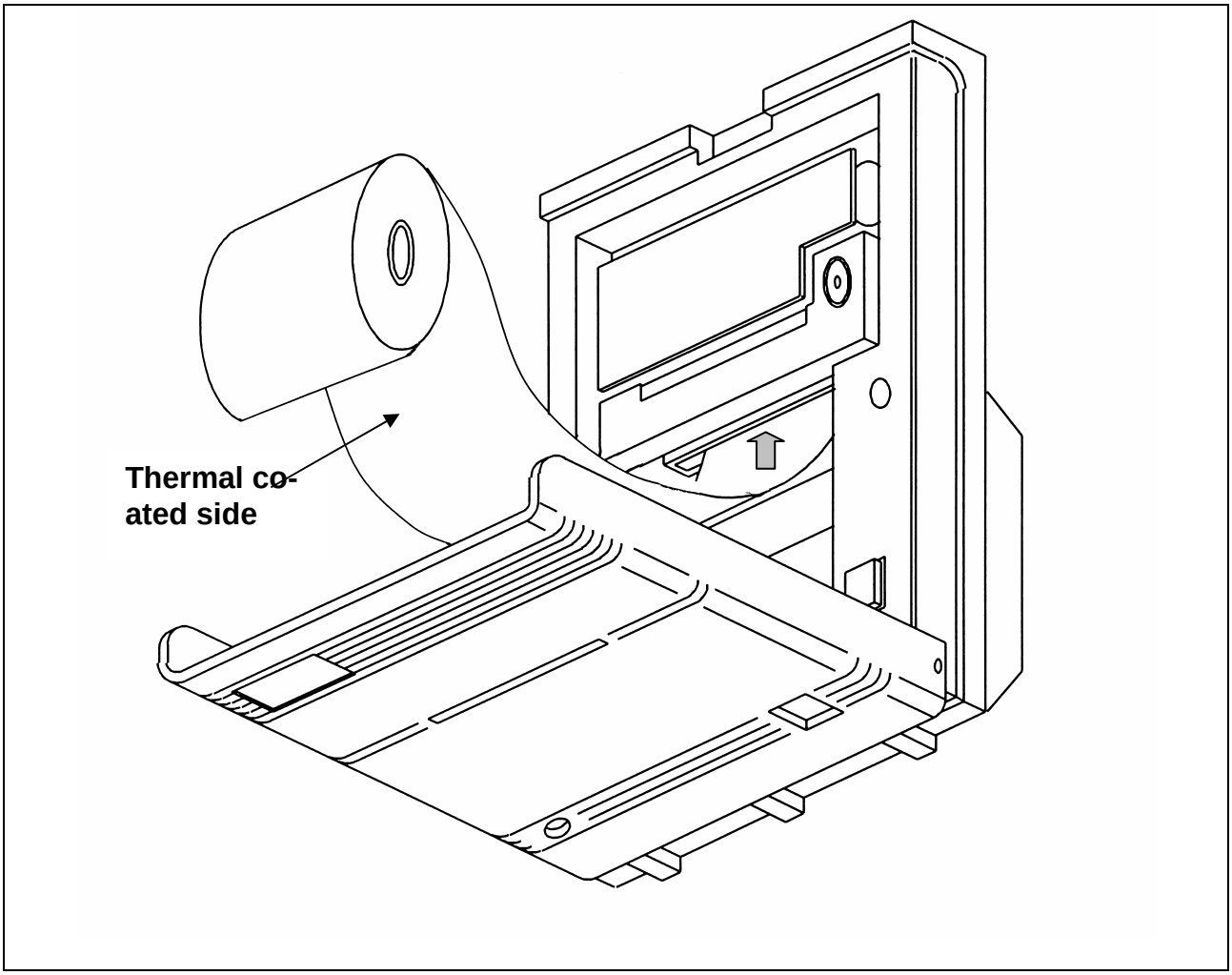


Figure 4 “Paper Loading”

d) Insert the paper strip into the slot indicated by the arrow, see sketch below, after having scissored away the corner as the tip of an arrow.

Pay attention to the orientation of the roll; if the roll is mounted in the reverse way, the thermal coating of the paper goes on the wrong side and no printing takes place.

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There is no ambiguity on the way the roll sinks in its cubicle , because, when the paper emerges from the mechanism, the glossy side should be in front of you.

e) Hold the red key P1 depressed until the paper comes out.

11.3.1 Paper

As replacement, you can order Cat. 2605 Package of 10 Heat-Sensitive Paper Rolls.

Replacement paper rolls can also be found on the local market. We recommend:-

- Jujo Paper, type TP50KS-A
- Honshu Paper, type FH65B-X14N
- Mitsubishi Paper Mills, type F-2000U7N5

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WIRING DIAGRAMS

7280-281ES01 sh 1 of 3	Wiring Diagram
7280-281ES01 sh 2 of 3	Wiring Diagram
7280-281ES01 sh 3 of 3	Wiring Diagram
2600-600EL01 sh 1 of 3	Electronic List
2600-600EL01 sh 2 of 3	Electronic List
2600-600EL01 sh 3 of 3	Electronic List
7280-D01EL01	Electronic List
2600-600EL02	Electronic List, Display Assembly
7280-281EC01	Board Component Layout
7280-281ES02	Wiring Diagram
7280-281EL02	Electronic List
7280-281ES03	Wiring Diagram
7280-281EL03	Electronic List
7280-281ES04	Wiring Diagram
7280-281EL04	Electronic List
7280-281ES05	Wiring Diagram
7280-281EL05	Electronic List
7280-281EC03	Board Component Layout
7280-281EW01	Cables and Connectors
7280-281EA01	Interconnection Diagram
7280-281EX01	Electronic List, External Components
7280-281ES06	Function Key Block Diagram

checked on 10/05/05 by

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